

# Land Discipline Report Back

Chris Justice

# Current Issues and Priorities

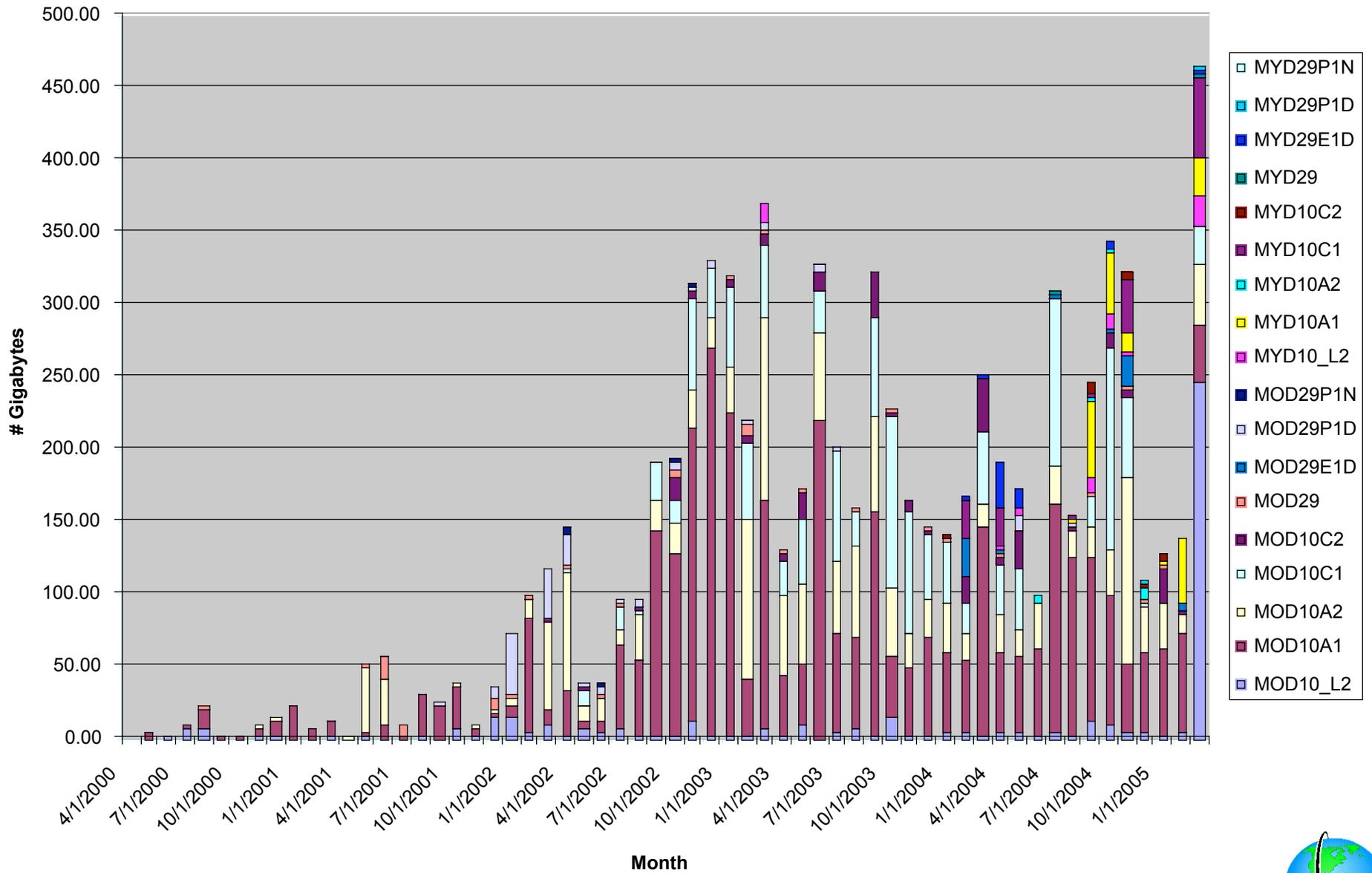
- **Broadening MODLAND** in the framework of the focus area measurement teams and land data processing following the Ocean Color Model
  - Recognizing important land building blocks e.g. Val LPV, QA LDOPE, Land Rapid Response, LADS, ORNL Subsets, DAAC Data Pool, VIIRS LAND PEATE, REASONS e.g. Land LDTR, GLCF, LEDAPS, TRFIC
- **Collection 5 Testing (highest priority)**
  - Greater emphasis on product testing prior to production
  - Development of the LADS (data distribution) of Test Data – land equivalent of the Atmospheres (AADS)
- **Validation**
  - Continuing Stage 2 validation
  - Where possible engaging users in the process of validation
  - LPV WG gathering momentum – transition to IGOS/GEOSS

# Current Issues Cont'd

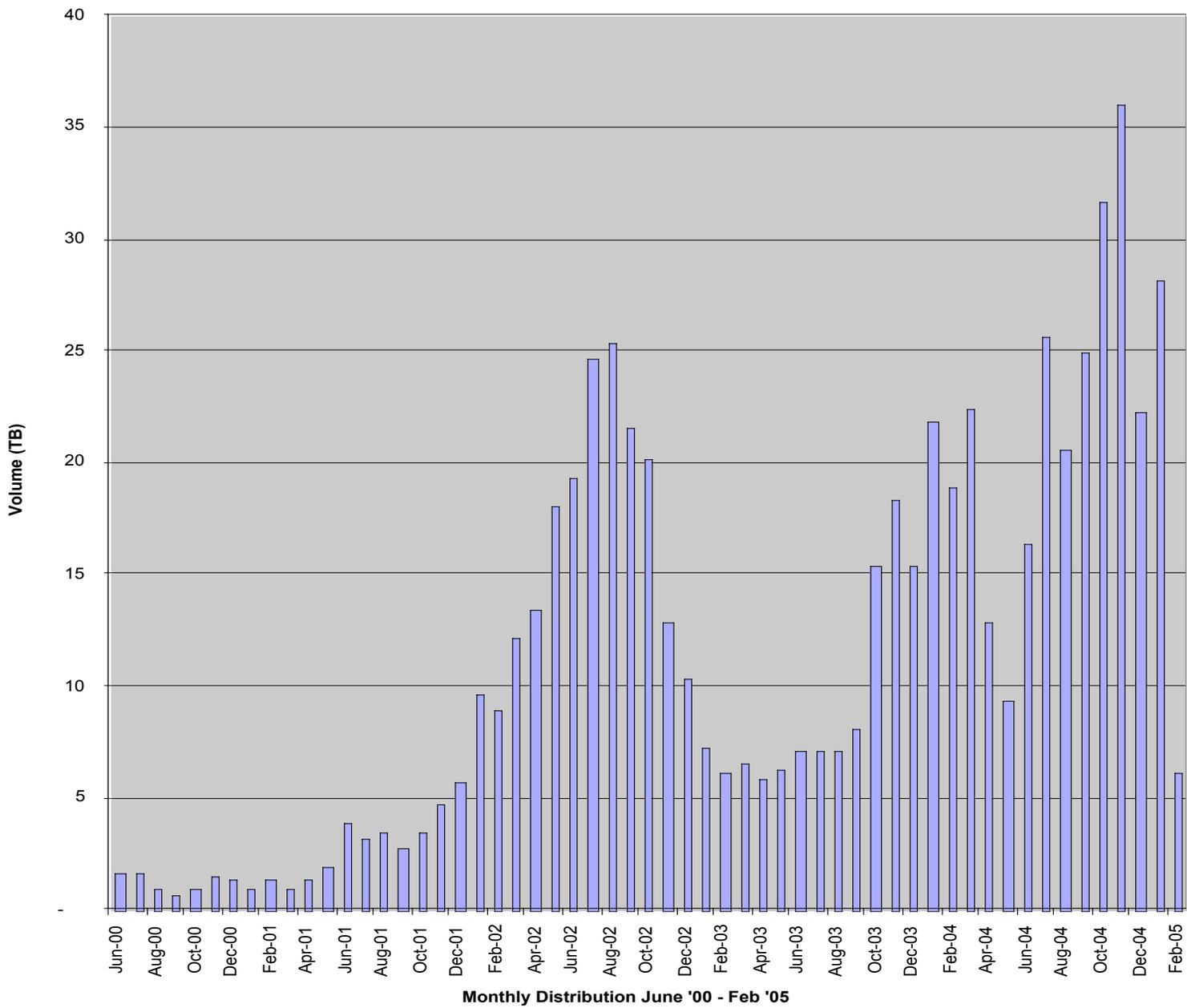
- **New Recompeted Land Products**
  - SCF Product Demonstration / Proof of Concept underway
- **Continued Community Outreach**
  - Publication of Results
  - Need to keep User Guides and Web Sites Current
  - Handle NSFAQ and requests as best we can
- **Recognize ramping down of MODIS SDST and MCST**
  - Decreasing staffing / broadening responsibilities
- **Distribution and Archive**
  - Continued growth in users and distribution from the DAACs (EDC, NSIDC)

- **Hard to keep track of all the new developments in the use of MODIS land products**
- **MODIS Land Direct Broadcast**
  - Real demand for information, code, advice
  - Need to build a self help community – lateral tech transfer
  - Prepare for NPP VIIRS
  - Land DB Workshop proposed – timing ?
    - Broader community DB meeting planned - Italy Oct '05
- **Continue to integrate Land Products into NASA Applications**
- **Need to raise the Community Voice**
  - Strong Advocacy for NASA Earth Science
  - Terra extension
  - The Landsat Continuity issue
  - International Cooperation e.g. GOFC/GOLD.

### MODIS Distribution at NSIDC: Volume

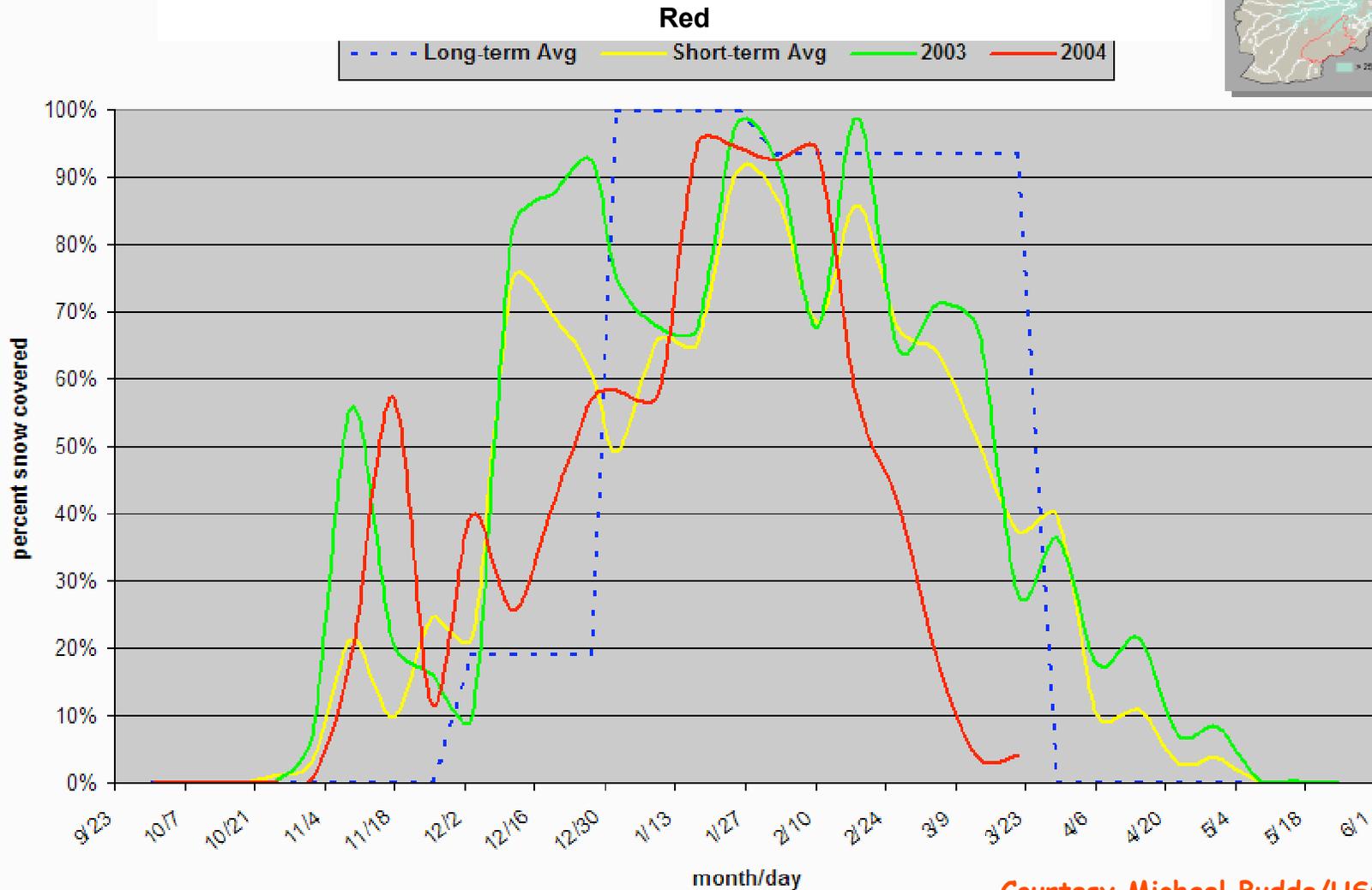
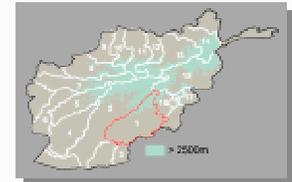


### MODIS Distribution from the LP DAAC: Volume



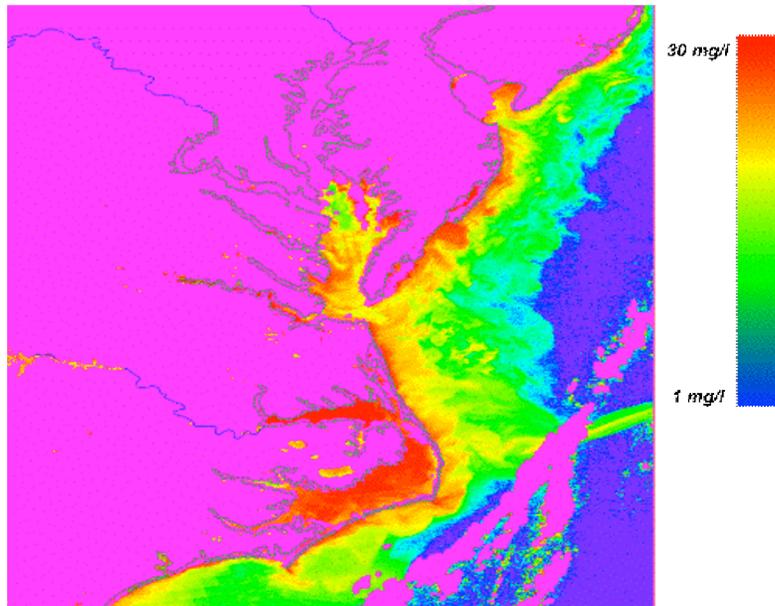
Snow-Cover Depletion Curves are Developed using MODIS 8-day Snow Maps (MOD10A2) for the Famine Early Warning System in Afghanistan to provide an indication of amount of seasonal snow cover for irrigation

Snow Accumulation/Depletion Curves above 2500m for the Basin Outlined in Red

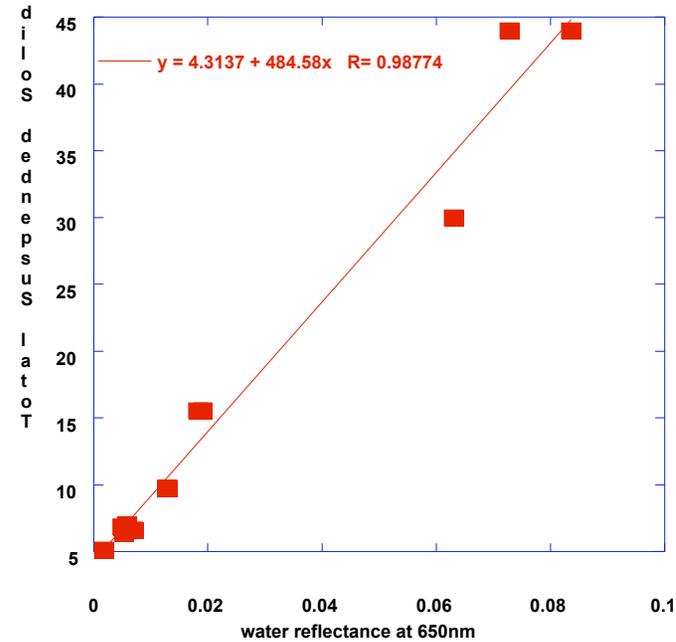


Courtesy Michael Budde/USGS

# Land bands are used for coastal water biophysical parameters retrieval



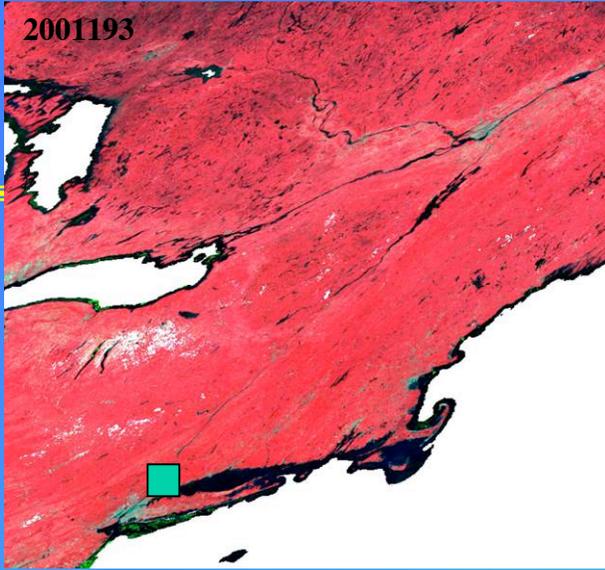
**Figure 9c.** TSS distribution on September 19th 2003 shortly after Hurricane Isabel landfall (From Matarrese et al. in press).



**Figure 9b:** Total suspended solids vs Surface reflectance at 650nm (for day 105 and 232 of 2003).

Vermote et al.

2001193

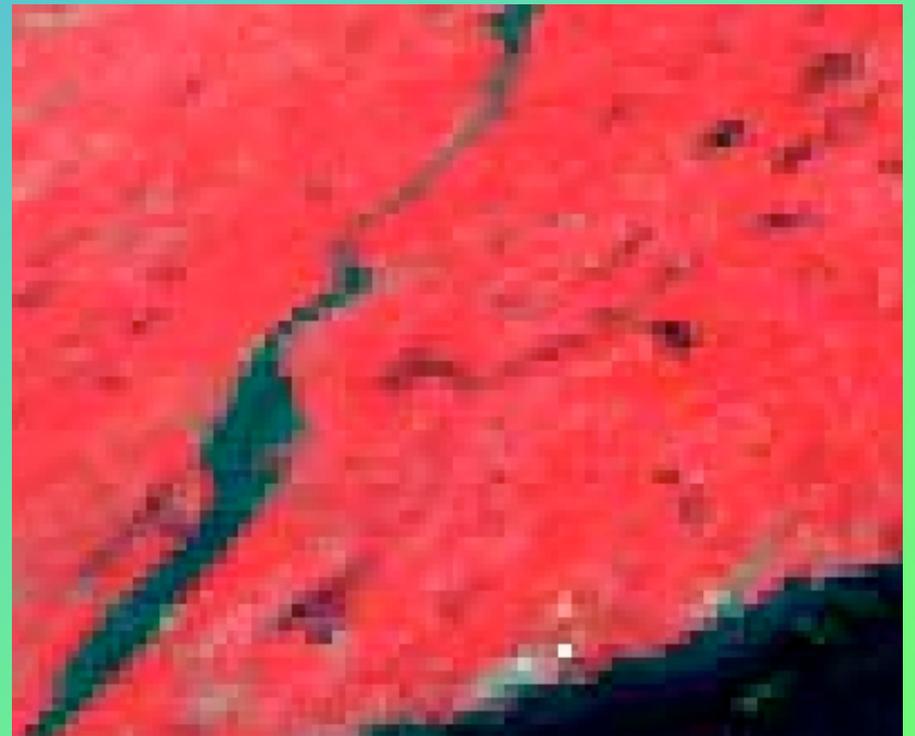


# V005 500m White-Sky Albedo

Schaaf et al.

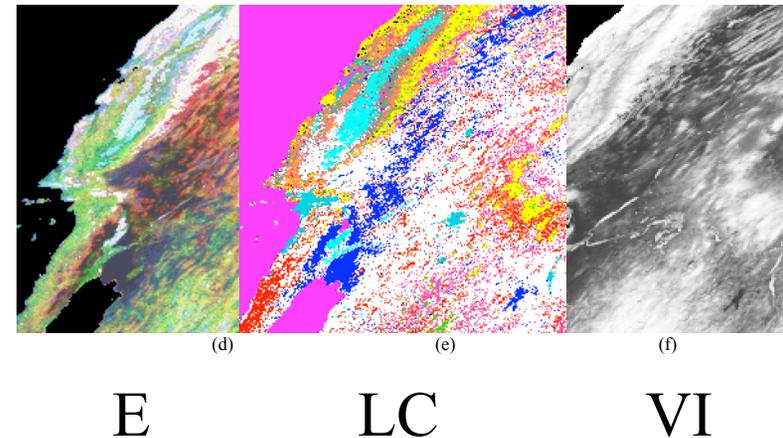
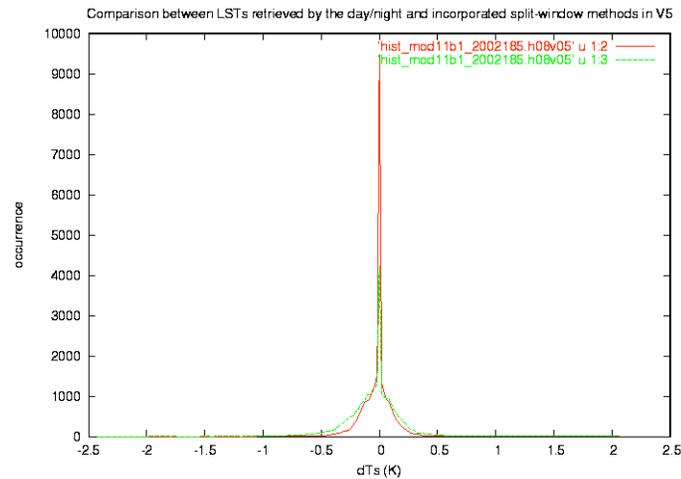
500m

1km



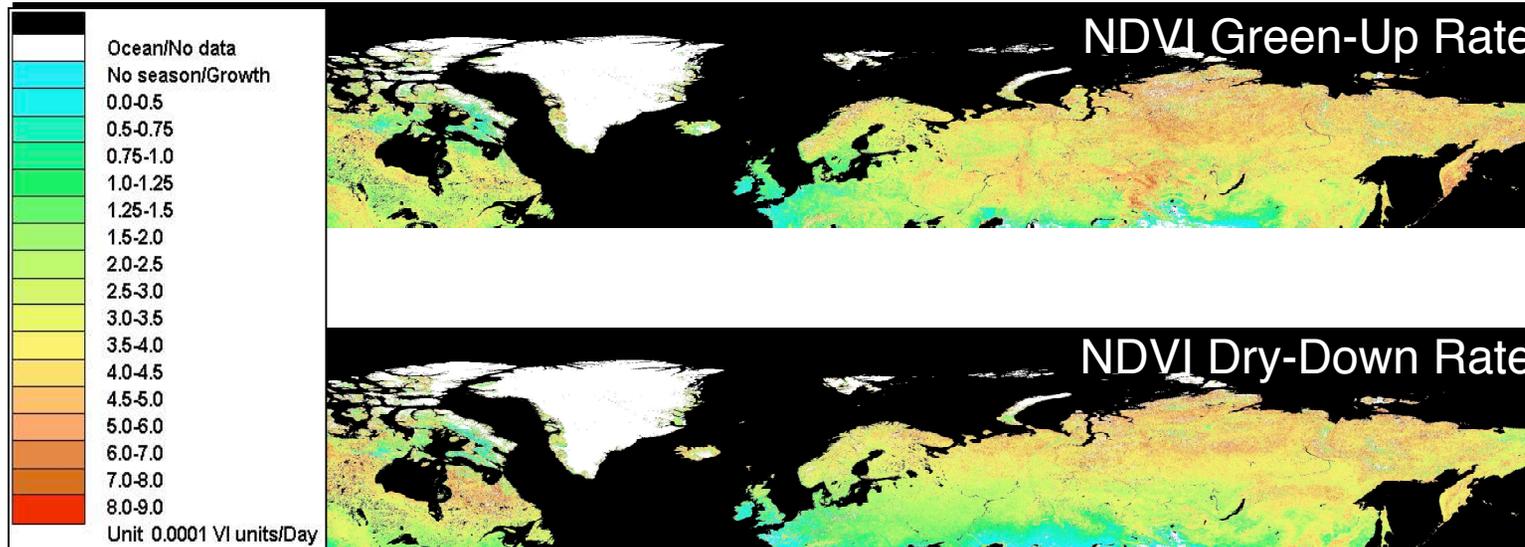
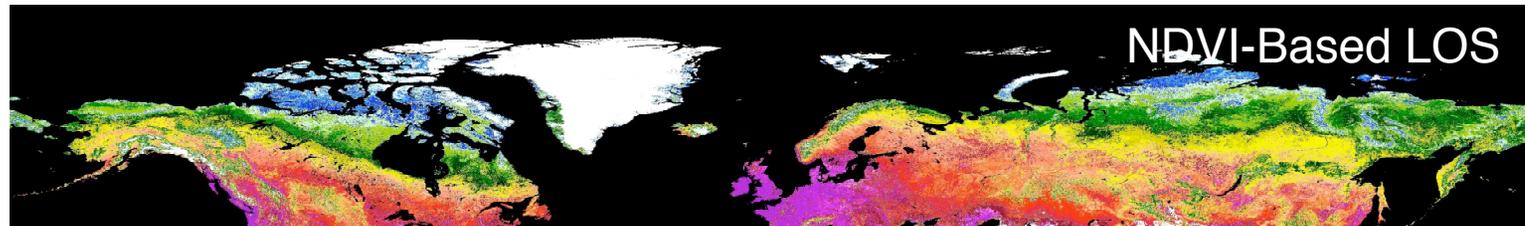
# New Refinements in the V5 Daily MODIS LST PGE Code (PGE16)

Zhengming Wan, ICESSE, University of California, Santa Barbara, CA



- Incorporating split window method in the day night algorithm
- Comparing emissivity with land cover and VI

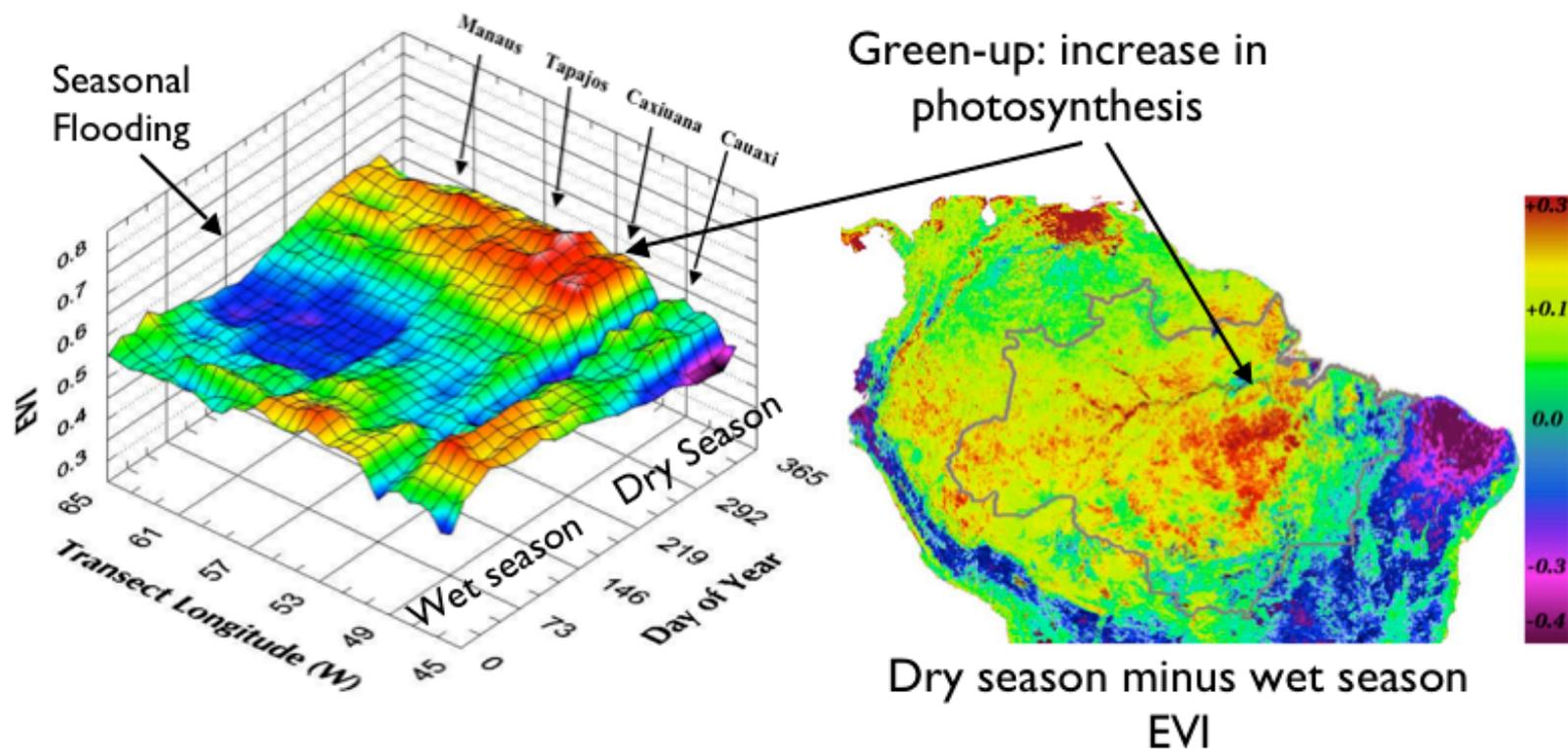
# NDVI based parameters



Huete, Didan et al.

# MODIS Vegetation Index sees Amazon Rainforest “Green-up” in Dry Season & Dry-down in Deforested Areas

{previously unseen due to saturation and cloud contamination}

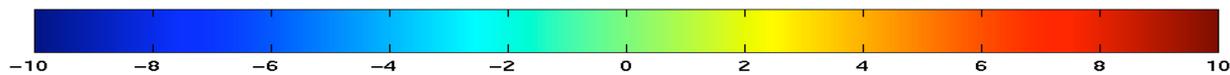
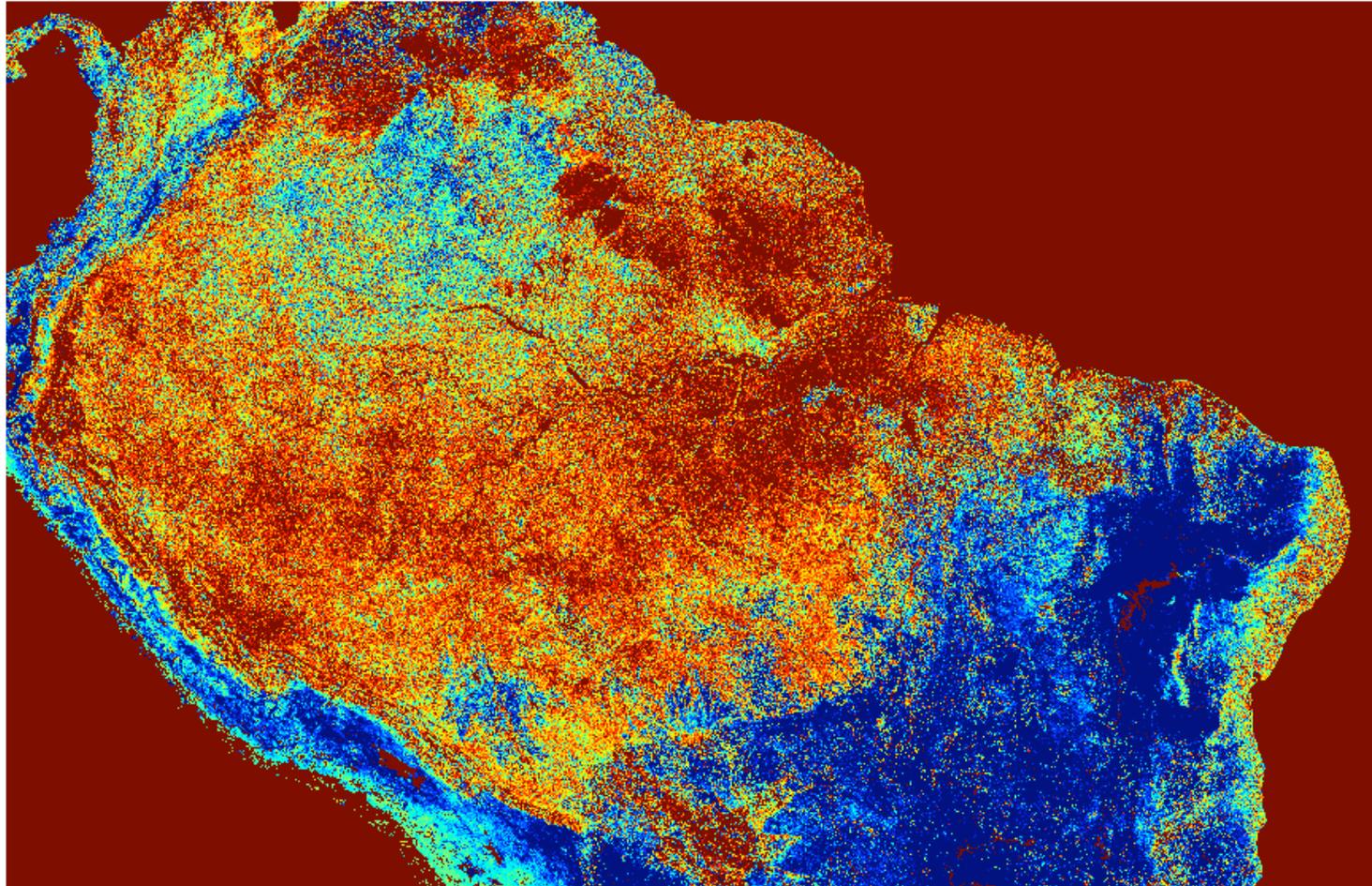


- Identified new dynamics in the dry season activity in the tropics in all FPAR, LAI, GPP/NPP and EVI/NDVI products

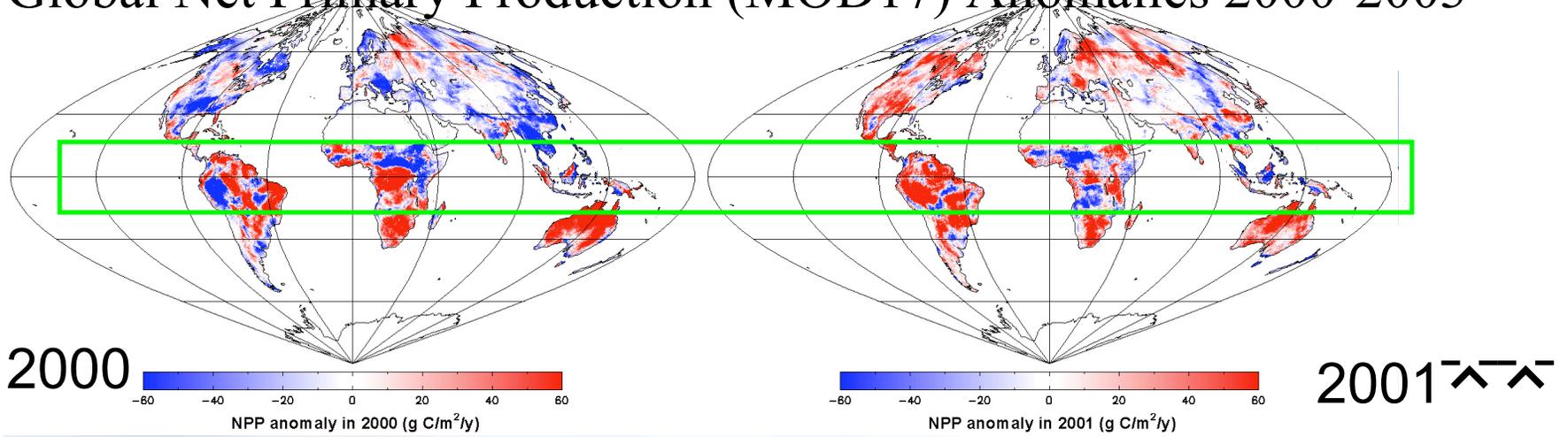
Nemani, Huete et al.



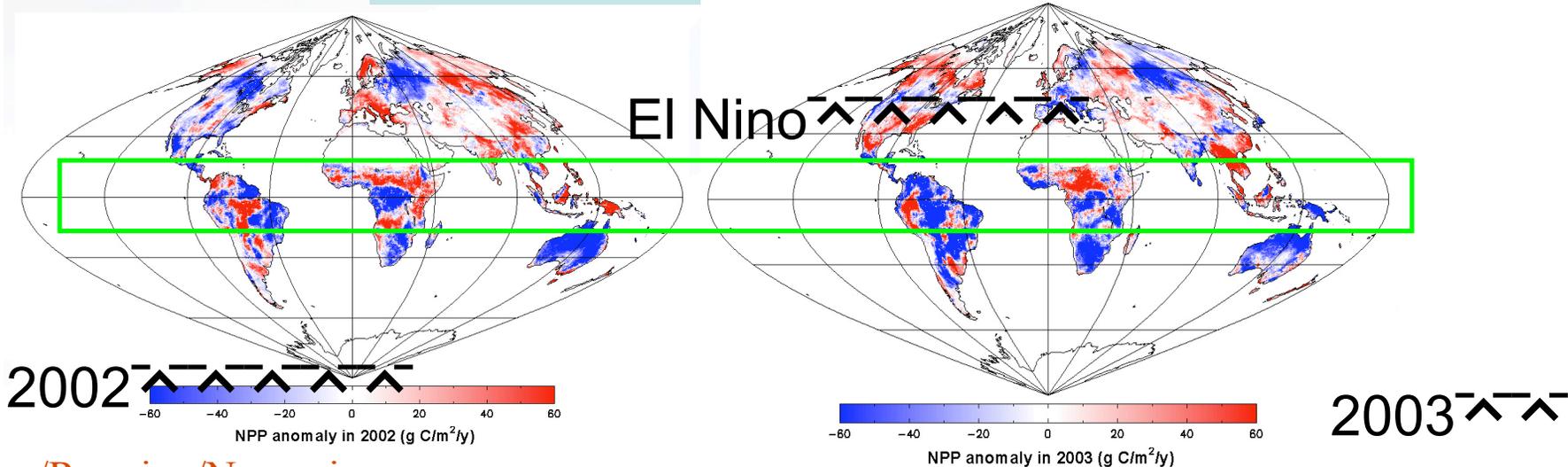
# Dry vs Wet season changes in MODIS Leaf Area Index based on 2000-2004 monthly composites



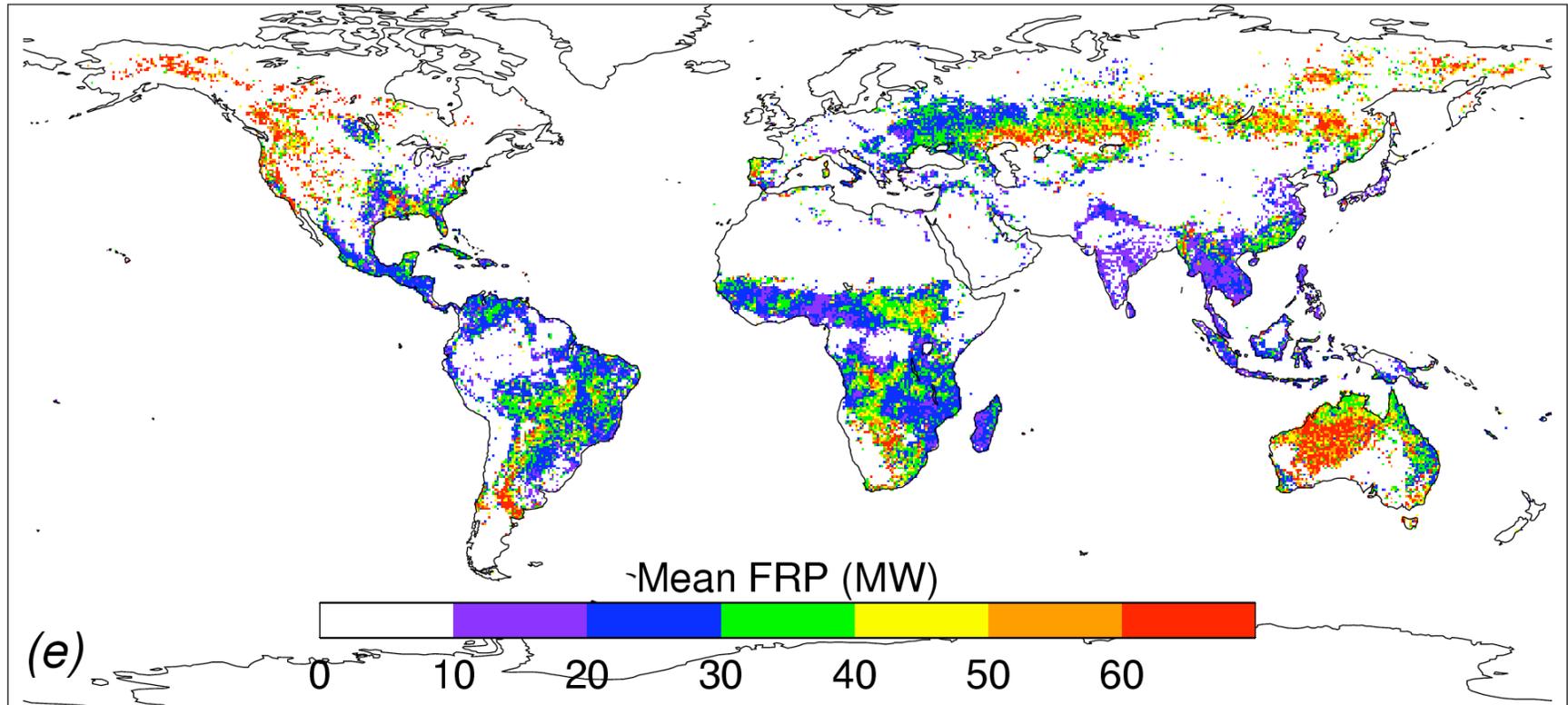
# Global Net Primary Production (MOD17) Anomalies 2000-2003



Year	NPP (Gt/y)	Trop. NPP (Gt/y)	CO2 growth rate (ppm/y)
2000	56.06	32.88	1.17
2001	57.74	33.21	1.56
2002	55.53	31.97	2.04
2003	54.80	31.25	2.54

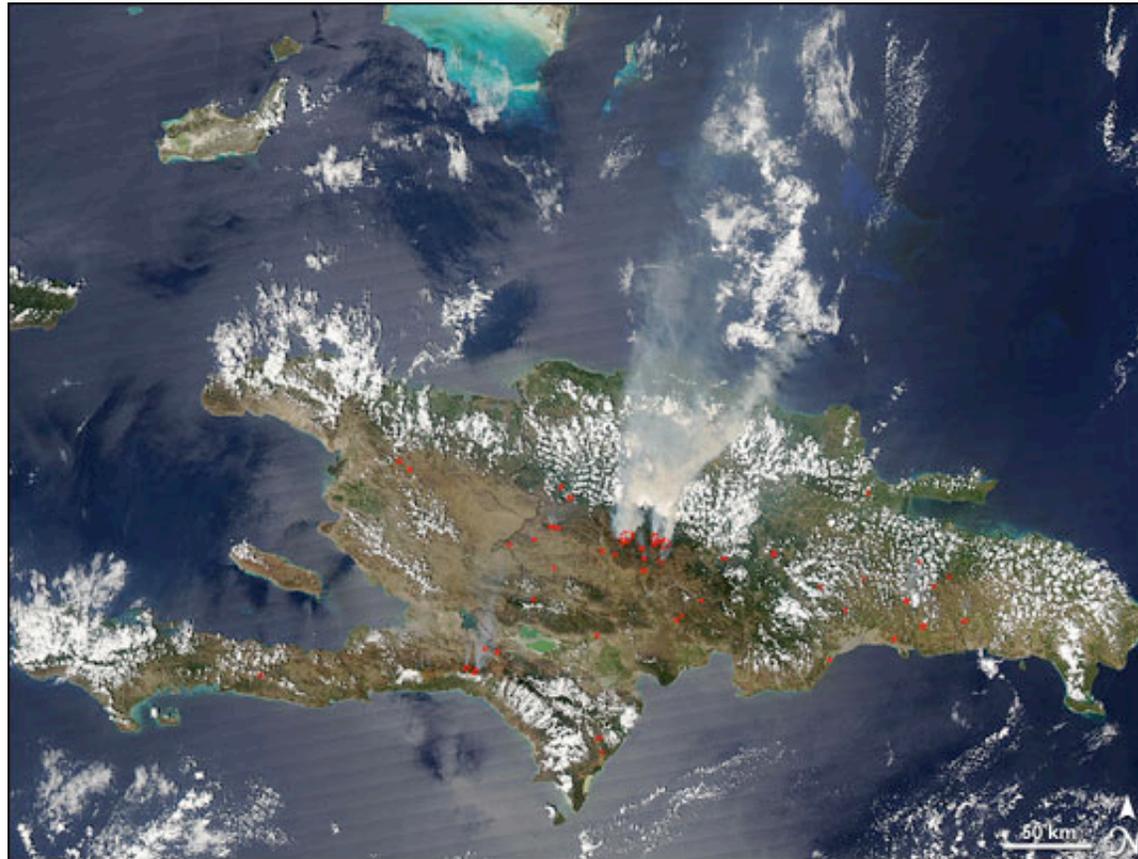


# Terra Mean Fire Radiative Power



Giglio et al.

## Land Rapid Response Continues to give high visibility to applications community



### Earth Observatory Story - Fires on Hispaniola

Smoke pours from fires burning in the Dominican Republic in this Moderate Resolution Imaging Spectroradiometer ([MODIS](#)) image, taken on March 18, 2005, by NASA's [Aqua](#) satellite.

# **Land Measurements Team – Earth System Data Records Summary of Discussions**

- **Earth System Data Records (ESDRs) are observations of a parameter of the Earth system optimized to meet requirements to address Earth science questions and to provide for applications.**
- **Designation of initial ESDRs/CDRs.**
  - **Priority derived from the importance of end uses.**
  - **Requirements are derived from end-user needs.**
    - **Science questions, applications, decision support**
  - **Engage relevant agencies, e.g., NASA, NOAA, USGS, USDA.**
  - **Compatible with other frameworks, e.g., GTOS, GCOS.**
  - **Consistent with records managed by other measurement teams.**
  - **Linked to historical measurements for continuity.**

## **Land ESDR/CDR White Papers**

- **Describe a candidate ESDR/CDR**
- **1 – 5 pages, submitted during summer 2005**
- **Scientific rationale and importance, expected end uses, implied requirements**
  - **Temporal and spatial resolutions, accuracy, precision**
- **Approach**
  - **Algorithms, processing/reprocessing, calibration/validation, product dependencies**
  - **Supporting activities, tasks**
  - **Feasibility, reliability, algorithm maturity, heritage**
  - **Relationships to other products**
- **Initial Topics**
  - **Reflectances, surface temperature, Land cover, snow cover, albedo, vegetation indices, LAI/fAPAR, primary productivity, fire**
  - **Liaison to surface hydrology ESDRs/CDRs**

# General Considerations

- **Low level and high level products are involved in ESDR's**
  - **Higher level products depend on products such as reflectance and vegetation index.**
  - **Hierarchical organization is useful**
  - **White papers would be structured accordingly in terms of requirements**
- **Explicit attention to error, uncertainty, and precision is required in definition and production.**
- **Issue of consistency between land sub-groups and ESDR's – important for the modeling community**
- **Need to not only define the ESDR but make the case as to why its critical to the program**
- **Need to consider what will be needed to create the retrospective data record**
- **Grouping by modeling objectives is desirable**

# Next Steps

- **Pay attention to the bigger picture e.g. Terra extension, Landsat, GEOSS, Earth Science at NASA**
- **Look for ways to do things better, faster, cheaper**
  - **Utilize the resources we have to the greatest effect**
  - **Some mid course correction may be needed**
- **Gather momentum on Land Measurement Team and CARS – specify the needs, variables and rationale ASAP – coordinate with other agencies**
- **Develop schedule for New Product ATBD reviews**
- **Look for opportunities to support HQ initiatives e.g. NACP, GEO**